PDQ-3D: A Prototype Three Dimensional Semantic Visualizer for Oncology Knowledge Sources*

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In this demonstration we will show a novel and intuitive method of browsing *Physician's Data Query* (PDQ), a complex cancer knowledge source from the National Cancer Institute (NCI). PDQ helps physicians diagnose and treat cancers, and it helps patients understand the implications of their disease and treatment. NCI maintains and updates PDQ monthly. A prototype display system, called **PDQ-3D**, exploits human spatial perception capabilities so as to help physicians use PDQ more easily.[1] With this browser, users of PDQ can understand where they are, where they came from, and where they can go next. **Figure 1**, shows the topics available in PDQ about "paranasal sinus cancer."

Information overload is a major problem in medical care today. In the past several years there has been a remarkable growth in the number and quality of electronic knowledge sources that can help caregivers maintain and even improve quality of healthcare. Medical textbooks can now be consulted from bedside terminals. The current medical literature about a patient problem can be accessed from a notebook computer. It is even possible to see multimedia presentations - pictures, video and audio - that explain symptoms or procedures more effectively than a printed text.

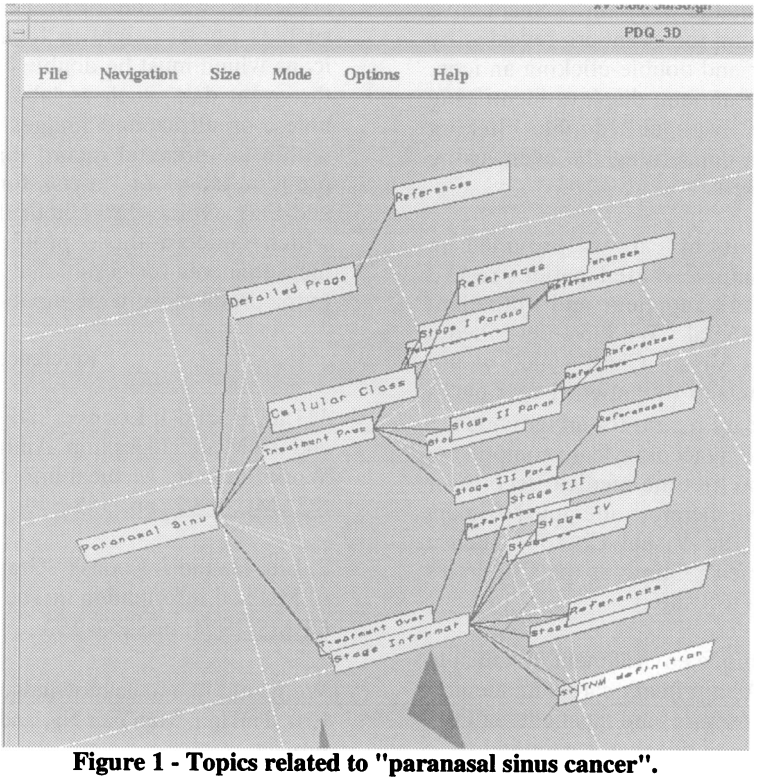

Figure 1 - Topics related to "paranasal sinus cancer".

Because these new knowledge sources are electronic, they can in principle be brought directly to the point of care. Healthcare providers now have the option to consult current knowledge sources at the bedside, at a nursing station, or in a physician's office. Every day, questions arise that could be answered by these electronic knowledge sources, e.g. "What is a tamoxifen flare?, How do you stage a paranasal sinus cancer?, Are there any protocols for the cancer my patient has and, if so, is there a local site my patient can go to?" But much of this medical knowledge is never consulted at the point of care. The questions may get answered, but by more traditional means -- perhaps by a trip to the medical library, or by telephoning a colleague. Why aren't electronic knowledge sources used more often and more effectively?

There are two key roadblocks. First, it takes a certain amount of cognitive effort to become productive in the use of these electronic knowledge sources. Second, getting to this knowledge takes time. But caregivers have no desire to become computer experts and they don't have the time to work their way systematically through knowledge sources, especially at the point of care.

There are promising developments that are moving beyond the research stage. Fast and economical computer platforms are emerging that enable visualization software systems such as **PDQ-3D** to provide caregivers quick and intuitive access to electronic knowledge sources. The idea is that a caregiver is much more likely to use a system if its use is clear and it rapidly leads to an answer.

In summary, as shown in **Figure 1**, **PDQ-3D** presents PDQ in the form of cone trees, a visualization developed at Xerox PARC, that allows users to understand the structure of PDQ without having to guess where useful topics might be found.

References

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1. Cole, WG, et al. Semantic Visualization of Oncology Knowledge Sources, SCAMC, 1995.